WE CLAIM:

1. A leadframe for use in the assembly of integrated circuit chips, comprising:
   a base metal structure having an adherent layer of nickel covering said base metal;
   an adherent film of palladium on said nickel layer; and
   an adherent layer of palladium on said palladium film, selectively covering areas of said leadframe suitable for bonding wire attachment and solder attachment.
2. The leadframe according to Claim 1 wherein said base metal is selected from a group consisting of copper, copper alloy, aluminum, iron-nickel alloy, brass, or invar.
3. The leadframe according to Claim 1 wherein said nickel layer has a thickness in the range from approximately 1 to 3 μm.
4. The leadframe according to Claim 1 wherein said nickel layer is a stack consisting of a nickel layer in the thickness range from about 30 to 50 nm, plated onto said base metal, followed by a palladium/nickel layer in the thickness range from about 30 to 50 nm, followed by a nickel layer in the thickness range from about 1.0 to 3.0 μm.
5. The leadframe according to Claim 1 wherein said palladium film has a thickness from about 1 to 5 nm.
6. The leadframe according to Claim 1 wherein said palladium layer has a thickness from about 70 to 90 nm.
7. The leadframe according to Claim 1 wherein said

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palladium layer covers selective areas having boundaries of loose tolerance.

8. The leadframe according to Claim 1 wherein said palladium layer provides visual distinction to the areas covered by said layer.

9. The leadframe according to Claim 1 wherein said base metal has a thickness between about 100 and 250 μm.

10. The leadframe according to Claim 1 wherein said solder attachment comprises materials selected from a group consisting of tin/lead, tin/indium, tin/silver, tin/bismuth, tin/copper, tin/silver/copper, and conductive adhesive compounds.

11. The leadframe according to Claim 10 wherein said solder layer has a reflow temperature compatible with wire bonding temperatures and molding temperatures.

12. A semiconductor device comprising:

a leadframe comprising a chip mount pad for an integrated circuit chip and a plurality of lead segments, each segment having a first end near said mount pad and a second end remote from said mount pad;

said leadframe having an adherent layer of nickel;

said leadframe further having an adherent palladium film on said nickel layer;

said leadframe further having an adherent layer of palladium on said palladium film, selectively covering said second ends of said lead segments in a thickness suitable for solder attachment, and further selectively covering the bonding wire attachment areas on said first ends of said lead segments in a thickness suitable for bonding wire attachment;

an integrated circuit chip attached to said mount pad;

bonding wires interconnecting said chip and said first ends of said lead segments; and

encapsulation material surrounding said chip, bonding wires and said first ends of said lead segments, while leaving said second ends of said lead segments exposed.

13. The device according to Claim 12 wherein said bonding wires are selected from a group consisting of gold, copper, aluminum and alloys thereof.

14. The device according to Claim 12 wherein the bonding wire contacts to said first ends of said lead segments comprise welds made by stitch bonds, ball bonds, or wedge bonds.

15. The device according to Claim 12 wherein said encapsulation material is selected from a group consisting of epoxy-based molding compounds suitable for adhesion to said leadframe.

16. The device according to Claim 12 further comprising lead segments having said second ends bent, whereby said segments obtain a form suitable for solder attachment.

17. A method for fabricating a leadframe having first and second surfaces, a chip mount pad, and a plurality of lead segments, each segment having a first end near said mount pad and a second end remote from said mount pad, comprising the steps of:

plating a layer of nickel on said leadframe;

masking said first surface to selectively expose said first and second segment ends;

plating a thick layer of palladium on said nickel

layer to selectively cover said exposed first and second segment ends to a thickness suitable for bond wire attachment and solder attachment, and plating a thin film of palladium on said nickel layer fully covering said first surface;

masking said second surface to selectively expose said second segment ends; and

plating a layer of palladium on said nickel layer on said exposed second segment ends in a thickness suitable for solder attachment, and plating a thin film of palladium on said nickel layer fully covering said second surface.

18. A method for fabricating a leadframe of copper or copper alloy, having first and second surfaces, a mount pad for an integrated circuit chip, and a plurality of lead segments having their first end near said mount pad and their second end remote from said mount pad, comprising the steps of:

cleaning said leadframe in alkaline soak cleaning and alkaline electrocleaning;

activating said leadframe by immersing said leadframe into an acid solution, thereby dissolving any copper oxide;

immersing said leadframe into a first electrolytic nickel plating solution and depositing a first layer of nickel onto said copper, thereby fully encasing said copper;

immersing said leadframe into a palladium/nickel plating solution and depositing a palladium/nickel alloy layer onto said first nickel layer;

immersing said leadframe into a second electrolytic nickel plating solution and depositing a second

layer of nickel onto said palladium/nickel layer, thereby adapting said second ends of said lead segments for mechanical bending;

masking said first surface to selectively expose said first and second segment ends;

spraying said leadframe with an electrolytic palladium plating solution to selectively cover said exposed first and second segment ends to a thickness suitable for bond wire attachment and solder attachment, and to deposit a thin film of palladium on said nickel layer fully covering said first surface;

masking said second surface to selectively expose said second segment ends; and

spraying said leadframe with an electrolytic palladium plating solution to selectively cover said exposed second segment ends to a thickness suitable for solder attachment, and to deposit a thin film of palladium on said nickel layer fully covering said second surface.

19. The method according to Claim 18 wherein the process steps are executed in sequence without time delays, yet including intermediate rinsing steps.

20. The method according to Claim 18 wherein said acid solution may be sulfuric acid, hydrochloric acid or any other acid.

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